

Destructive and Natural Fracture Pruning Techniques

Andrew Cowan - ArborEcology



Traditionally skilled arborists use the accuracy and quality of target pruning as a standard for arboricultural excellence, cutting back to the branch collar with surgical precision, while removing every last fragment of dead wood from the crown of an amenity tree. However, although this may be perceived as the best way to manage a specimen tree in the ornamental setting of a residential park or garden, and it could well contribute to a long useful life expectancy, is it always the most appropriate? This article considers the use of destructive pruning techniques utilised to maintain a natural aesthetic, enhance wildlife habitat and maintain healthy arboreal ecosystems.

I have been inspired by trees for over two decades now; from an early interest in their organic form that influenced my artistic interpretations of natural landscapes during art lessons as a teenager, through training as an arborist, to my professional work today where I consider myself to be an arborecologist with an appreciation of how trees grow within an arboreal ecosystem. I believe my development within arboriculture reflects how our ideas have evolved with an increasing understanding of what makes a healthy tree.

When I first studied arboriculture in the late 1980's we were taught the 'word according to Shigo' with the accuracy of target pruning held up as the ultimate panacea that represented quality tree care, while many contractors calling themselves 'tree surgeons' were still filling tree cavities with concrete and removing branches with flush cuts. However, our arboricultural understanding has moved on yet again and I am now considering the use of pruning techniques that I would have once frowned upon and described as bad practice.

As a young arborist I concentrated on tree pruning work that improved the aesthetic form of the tree by removing branches that appeared to be visually out of place and at odds with my interpretation of what an ideal tree should look like. However, I started to realise that my obsession with a human perspective of the 'perfect' tree form did not always result in pruning decisions that also promoted healthy tree growth. Meanwhile I was beginning to appreciate that my arboricultural knowledge required a broader understanding of a diversity of organisms that interact in cooperative, co-evolutionary, mutually beneficial relationships that are part of an extensive ecosystem within which the tree grows.

In the mid 1990's I found inspiration within an enthusiastic group of people who, with a shared interest in particularly old trees, had formed the Ancient Tree Forum (ATF) www.ancient-tree-forum.org.uk. Since then I have had the opportunity to explore some incredible sites across the UK, from Cornwall





This tree was condemned by the application of a florescent pink dot that identified it as a hazard to the adjacent foot path due to an extensive cavity running up the trunk. However, the use of some destructive pruning techniques enabled its sympathetic retention within the natural context of the woodland edge, appearing as if subject to the high winds of a recent storm with the associated habitat maintained and enhanced.

up to Scotland, where the ATF have arranged field trips to walk among and discuss collections of ancient trees that represent an internationally important arboricultural resource, which we are barely beginning to appreciate. Given the chance to debate the management of these trees with an eclectic group of ecologists, mycologists, lichenologists entomologists, archaeologists and arborists, offered me a real insight into trees as a living system.

The pruning techniques described and illustrated within this article form part of a broad array of new ideas that have developed from the management of ancient and veteran trees, where the emphasis has moved away from an obsession with maintaining a visually 'healthy' tree to embrace a wider ecological objective. As an arborist I now consider the management of arboreal ecosystems with consideration and appreciation for a community of organisms living together in an extensive circle of life where mutual relationships have been evolving for hundreds, maybe thousands of years.

Natural Fracture Techniques involve pruning methods that are used to mimic the way that tears and fractured ends occur on trunks and branches. A coronet cut is a type of natural fracture technique that is particularly intended to mimic jagged, shattered ends characteristically seen on broken branches following storm damage or static limb failure. Neville Fay and his team at Treework Environmental Practice (TEP) have been developing these techniques over a number of years now, with much of their work focused around the management of ancient tree populations.

The range of cutting treatments now used in this pruning method were principally developed to manage ancient trees, but are also used on other, much younger, trees in a destructive pruning technique called verteranisation. This involves the deliberate cutting of branches and trunk sections to encourage the development of decay and to initiate the progressive formation of cavities that offer dynamic features with suitable conditions for the survival of a diversity of co-evolutionary arboreal partners. Such techniques are particularly important where the disparate age class structure of an area means that as old trees die the suite of organisms living with them have nowhere to go, because the features they need to survive have not developed in the much younger adjacent trees.

Trees shed branches as a natural part of their living ecology, through mechanical weakness as a result of decay, or past wounds, and as a means of reducing the damaging impact of high winds. These failures occur throughout the



Fire ravaged trees on Ashted Common left the site managers with an aesthetic challenge that was to be resolved with a new pruning technique that has inspired a progressive development in arboricultural work.



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The coronet cut acquired its name from the appearance of early examples that resembled the points of a crown, but in some cases this can look just as artificial as the alternative stubby flat cut. A successful coronet cut should be almost indistinguishable from the shattered end of a storm damaged branch.

crown and are rarely uniform, appearing haphazard, but are an integral part of the trees life cycle. The broken ends of branches and trunks include fibre separation (along the grain) and splintering in various planes (linear, radial and circumferential). These shattered ends offer an aerial habitat that is utilised by a diverse range of organisms.

Coronet Cuts are used as part of a new tree work technique known as Natural Fracture Pruning. What we now call Coronet Cuts are a pruning method derived from some pioneering ideas developed by Bob Warnock (2000) at Ashted Common National Nature Reserve in Surrey, managed by the Corporation of London (www.corpoflondon.gov.uk). Here the pruning techniques were developed to maintain a natural aesthetic, where a large number of ancient and veteran trees, were damaged by fire and had to be made safe. Extensive reduction work was required and it was thought that the flat stubby ends that could result from such pruning would make the remaining tree trunks look artificial in the essentially wild landscape of the nature reserve.

In a wooded context, valued for its natural aesthetic, the clean flat surface of a pruning wound can stand out and appear at odds with the wild natural setting in which the tree is growing. However, the skilful creation of Coronet Cuts that may be sculpted on the stub ends of both dead and living branches can give the appearance of a natural failure that could have occurred in high winds. There can also be some ecological benefit to leaving snags as a habitat, while skilled arborists are developing the techniques to include roost sites for bats and creating cavities for nesting birds.

Observing the growth character of trees post storm damage, or branch failure, appears to indicate that torn often extended wounds may stimulate a broader spread of regenerative shoots. This reiterative growth also appears more dispersed along the branches, with better attachment, than would be expected to occur from a flat pruning wound left after cutting with a saw. This is particularly true of small dimension branches and such techniques are now commonly used in the reduction of ancient lapsed pollards, where it is important to encourage the regeneration of an inner crown before the extended leverage of the upper limbs causes its terminal break up.



Photographs (above and left) were taken in Scadbury Park, Orpington, Kent, (2005) where work was undertaken for Bromley Council who were concerned about the dead and dying branches of an ancient oak tree over a well used public path, but did not want to leave the ancient oak looking like a street tree pollard stripped of all natural character and visually appearing at odds with the wild context of the nature reserve. The dead limbs were reduced and coronet cuts made at the stub ends to give the visual appearance of shattered branches that could have been left following a natural storm event.



Destructive pruning techniques were also used to incorporate roosting opportunities for bats and cavities that could be used by nesting birds.



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Ancient pollard oak on Wickham Common Kent, illustrating progressive retrenchment pruning regime following a 30 year management plan produced by Treework Environmental Practice, for the City of London.



The Retrenchment Pruning methods developed by Paul Muir of TEP (www.treeworks.co.uk) use Natural Fracture Techniques to imitate the natural aging process in trees. The pruning treatment is used to imitate the natural process of crown retrenchment where peripheral dieback occurs as the tree redirects energy and growth to the formation of a consolidated lower more compact crown form.

Retrenchment pruning techniques can be used to reduce the potential for a fully mature, late-mature or ancient tree to collapse or 'fall apart', while it is especially useful for managing formerly pollarded trees (lapsed pollards) and mature trees showing signs of dieback.

The process is intended to promote internal and lower crown rejuvenation with induced reduction in apical dominance providing the means to redirect hormonal growth regulation (resulting in epicormic and reiterative stimulation). Undertaken through a series of treatments spread over decades, retrenchment pruning can create a reduced but stronger and vital crown framework.

Where larger branches have to be removed, perhaps due to health and safety concerns, the inevitably large wound that results is not made close to the trunk as it would be with target pruning techniques. Oversized pruning cuts on the trunks of trees are something to be avoided if you are concerned about maintaining a long life expectancy, so large limbs are foreshortened to a stub some distance from the main stem. The abrupt stub end can then be aesthetically softened by careful use of a chainsaw to mimic the loss of the branch through natural causes by carving a coronet cut.

Developing a vocational career in arboriculture is an evolutionary process, where new ideas, hypotheses and theories are almost continuously being debated, developed, expanded, tested and adopted. It is therefore essential that arborists, researchers and academics alike maintain an open mind.

Arboriculture is a study and appreciation of organic living processes that are by their very nature dynamic, while some are in a constant state of flux. Our understanding of trees and the arboreal ecosystem, of which they are a part, is in its infancy. To develop and grow within arboriculture we have to expand our knowledge by exploring the world of trees. We must adopt a philosophy of working with trees and constantly learning from them, developing our knowledge, understanding and appreciation.

Trees, as long lived organisms, are slow to react to changes in their environment. Our increasingly fast pace of life means that we can inflict change on our surroundings in quick succession. A tree, which may fall victim to this, will suffer stresses that could culminate in premature death after being forced into a spiral of decline.

The reactive capacity of a tree will be compromised to some degree, depending on the pruning techniques employed, and the volume of living wood and foliage which is removed at any one time. When making pruning decisions the arborist must consider the chronological age of the tree, because a tree in its formative years may be able to tolerate the loss of a large limb, but the same tree in full to late maturity might suffer terminally when inflicted similar treatment.

Controlled ripping pruning cuts are an integral part of retrenchment pruning techniques that are designed to encourage a broader distribution of re-growth along the pruning wound.